The Official Action notes that the specification as filed does not follow the guidelines for preferred layout. The Official Action further notes that the spacing of the lines of the specification is such as to make reading and entry of amendments difficult, and new application papers are required. Accordingly, applicants include herewith a substitute specification. The substitute specification is double-spaced and follows the convention for U.S. applications. No new matter is added by the substitute specification.

The Official Action rejects claims 1-11 under 35 USC §112, second paragraph, as being indefinite. Applicants carefully reviewed the claims and amended the same as necessary in order to eliminate the bases for this rejection. Reconsideration and withdrawal of this rejection are therefore respectfully requested.

The Official Action rejects claims 1-5 under 35 USC §102(b) as being anticipated by ZWICKER et al. 4,712,244. Reconsideration and withdrawal of this rejection are respectfully requested for the following reasons:

The hearing aid according to the present invention as defined in claim 1 of the present patent application comprises an array of microphones (8-12). The array has two main sensitivity directions (5, 6) running at an angle with respect to the main axis of the array. The invention includes a means for deriving the first and a second array output signal from the output

signals of the microphones. The first output signal is associated to the first main sensitivity direction, while the second array output signal is associated to the second main sensitivity direction. The first array output signal is fed to a first transmission path for transmitting said output signal to, for example, a left ear of a user while the second array output signal is fed to a second transmission path transmitting the signal to, for example, the right ear of a user.

ZWICKER et al. disclose a hearing aid comprising an array of microphones M1, M2, M1', and M2' having electrical signal outputs, which are combined in the means 20, 21, in which the circuit of Figure 2 is accommodated. The electrical signal outputs of the microphones M1-M2' are combined in elements 19 and 20, as implemented in Figure 2. The electrical signal outputs from the microphones M1-M1' are processed and combined to produce one single array output signal SA'. Said signal SA' is fed to one transmission path for one ear and the same signal is fed to the transmission path for the right ear.

In contrast to the hearing aid suggested by ZWICKER et al., the hearing aid of the invention has means for deriving two array output signals from the microphone output signals. The first array output signal is associated with one main sensitivity direction, while the second array output signal is associated with the second sensitivity direction of the array.

Furthermore, it is emphasized that as a distinction from the known hearing aid in the hearing aid of the present invention, the first array output signal is fed to a first transmission path for one ear, while the second array output signal is fed to the second transmission path for the other ear.

In contrast, in the hearing aid of ZWICKER et al., only one and the same array output signal SA' is fed to both transmission paths for each ear. Further, the array of microphones as shown in Figure 3 of the reference has only one main sensitivity direction. In this connection, we refer to U.S. Patent No. 4,712,244 of the same assignee as the above-mentioned U.S. patent.

According to the text in column 2, line 53 - column 4, line 6 of the latter U.S. patent, the two hypercardioid characteristics of the microphones M1, M2 and M1', M2' respectively, are combined into one characteristic being more distinct directional, i.e., one main sensitivity direction, not two as recited in connection with the present invention.

The same is true with respect to the locating microphones M01 and M02, disposed above or within the left and right ears respectively according to ZWICKER et al. Said microphones have the function of locating the sound source and are not used for producing a first sensitive direction and a second sensitive direction for the array of microphones, as described in column 4, lines 8, 9 and 14-18. According to the

latter passage, the hearing-impaired person locates a sound source of interest by means of the locating microphones M01 and M02 and turns his or her head with the hearing aid eyeglasses in the direction of the sound source.

The signal SA is added to the signal from microphone M01 and the added signal is supplied separately to the left ear, while the added signal consisting of the signal SA and the signal from the microphone M02 is supplied to the right ear.

As a result, the signals from the locating microphones M01 and M02 received by the left and right ear respectively are therefore equal.

Furthermore, in contrast to prior art, a first output signal associated to a first main direction and a second output signal associated to a second main direction are produced by the present invention as claimed, which output signals are different from each other. The first output signal differing from the second output signal and belonging to a first sensitive direction of the eyeglasses is supplied to one of the ears via a separate transmission path, while the second output signal belonging to a second sensitive direction is supplied to the other ear through a different transmission path.

For all of these reasons, the applied reference fails to anticipate the present rejection as claimed.

The Official Action rejects claims 6-11 under 35 USC §103(a) as being unpatentable over ZWICKER et al. in view of LEHR

et al. 5,793,875. Reconsideration and withdrawal of this rejection are respectfully requested for the following reasons:

The secondary LEHR et al. reference is offered for its asserted teaching of the recited series circuit, a weighting factor device, and the amplitude adjustment thereof. Irrespective of this reference's ability to teach or suggest that for which it is offered, it nevertheless fails to overcome the shortcomings of the primary reference. Therefore, the detailed analysis offered above in connection with the anticipation rejection is equally applicable to the present obviousness rejection.

In light of the amendments described above and the arguments offered in support thereof, applicants believe that the present application is in condition for allowance and an early indication of the same is respectfully requested.

If the Examiner has any questions or requires further clarification of any of the above points, the Examiner may contact the undersigned attorney so that this application may continue to be expeditiously advanced.

Attached hereto is a marked-up version of the changes made to the claims. The attached page is captioned "VERSION WITH MARKINGS TO SHOW CHANGES MADE."

Respectfully submitted,

YOUNG & THOMPSON

By _____

Eric Jensen
Attorney for Applicants
Registration No. 37,855
745 South 23rd Street
Arlington, VA 22202
Telephone: 521-2297

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

Claim 1 has been amended as follows:

--1. (amended) Hearing aid for improving the hearing ability of the hard of hearing, comprising:

an array of microphones (8-12), [the] electrical output signals of [which are fed] the array of microphones being fitted to at least one transmission path belonging to an ear, [characterised in that] Oke so far

means [are provided] for deriving two array output signals from the output signals of the array of microphones (8-12; 26-36), the array of microphones having two main sensitivity directions (5, 6) running at an angle with respect to [the] a main axis of the array, and each of [which is] the sensitivity directions being associated [to an] with a respective one of the array output [signal] signals, [and in that] each array output signal [is fed] being fitted to its own transmission path, one to the left ear and [the other] another to the right ear of a person who is hard of hearing.--

Claim 2 has been amended as follows:

--2. (amended) Hearing aid according to claim 1, [characterised] characterized in that the array (29-33) is mounted on [the] a front (2) of a pair of spectacles.--

Claim 4 has been amended as follows:

--4. (amended) Hearing aid according to claim 2, [characterised] characterized in that each arm (3, 4) of the spectacles is provided with an array of microphones and in that the output signals from said arrays are each fed to [the one or, respectively,] a respective one of the [other] transmission [path] paths.--

Claim 5 has been amended as follows:

--5. (twice amended) Hearing aid according to claim 1, [characterised] characterized in that the means for deriving the array output signals [contain] comprises a summing device (18), [from the output of which an] one of the array output [signal can be taken off and to the inputs of which] signals being connected to an output of the summing device, the microphones output signals [are] being fed via a respective weighting factory device [(13-17)] to an input of the summing device.--

Claim 6 has been amended as follows:

--6. (twice amended) Hearing aid according to claim 1, [characterised] characterized in that the means for deriving the array output signals [contain] comprises a series circuit of a number of summing devices (23, 24, 25, 26) and weighting factor devices (18, 19, 20, 27), the outputs of the microphones (9-11) that are arranged between [the] two outermost of the microphones (8-12) being connected to [the other] inputs of [the] respective

said summing devices[, which other inputs] that are not connected to [a] one of the weighting factor [device] devices, [in that] a first one (12) of the outermost microphones of the array [is] being connected via a first of the weighting factor [device] devices (27) to [the] an input of a first of the summing [device] devices (26) associated with [the] an adjacent said microphone (11), [and in that the] an input of a second of the weighting factor [device] devices (18) [is] being connected to [the] an output of a second of the summing [device] devices (24) connected to one of the [microphone] microphones adjacent to a second one of the [other] outermost [microphone] microphones (9), [the one] a first input of a third of the summing [device] devices (23) being connected to the output of said second weighting factor device (18), the output of the [last-mentioned] second outermost microphone (8) being connected to [the other] a second input of the third summing device (23), [and it being possible] so as to [derive] produce an array output signal at the output of the summing device (23).--